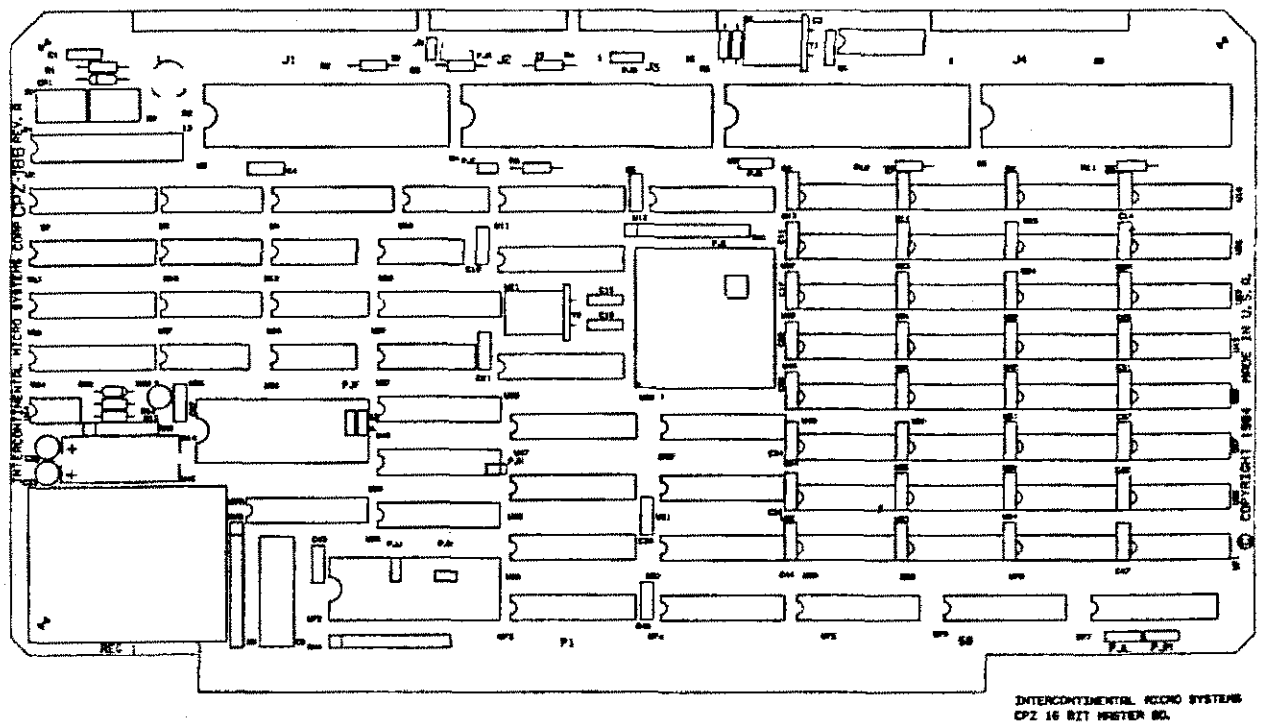
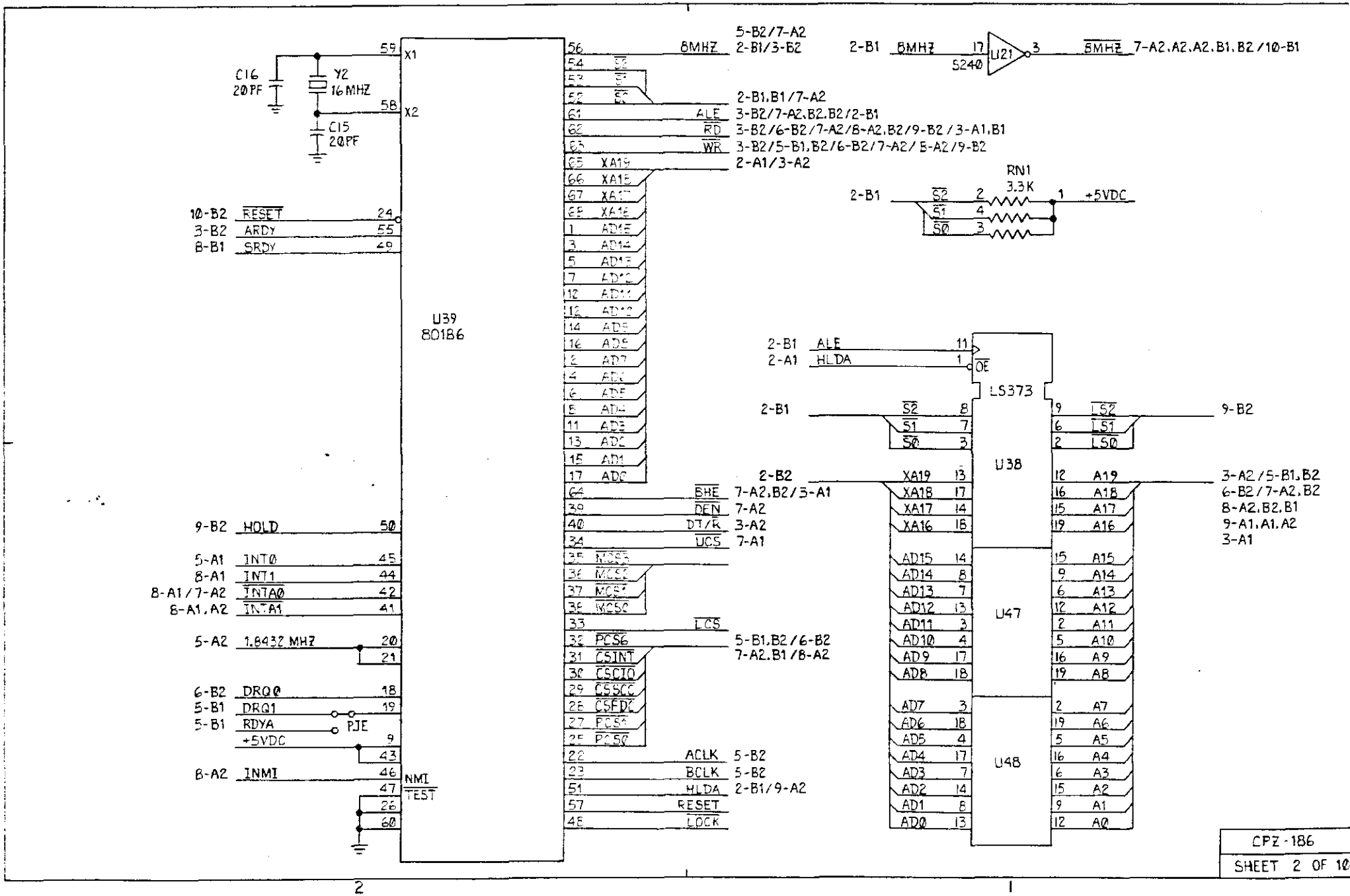
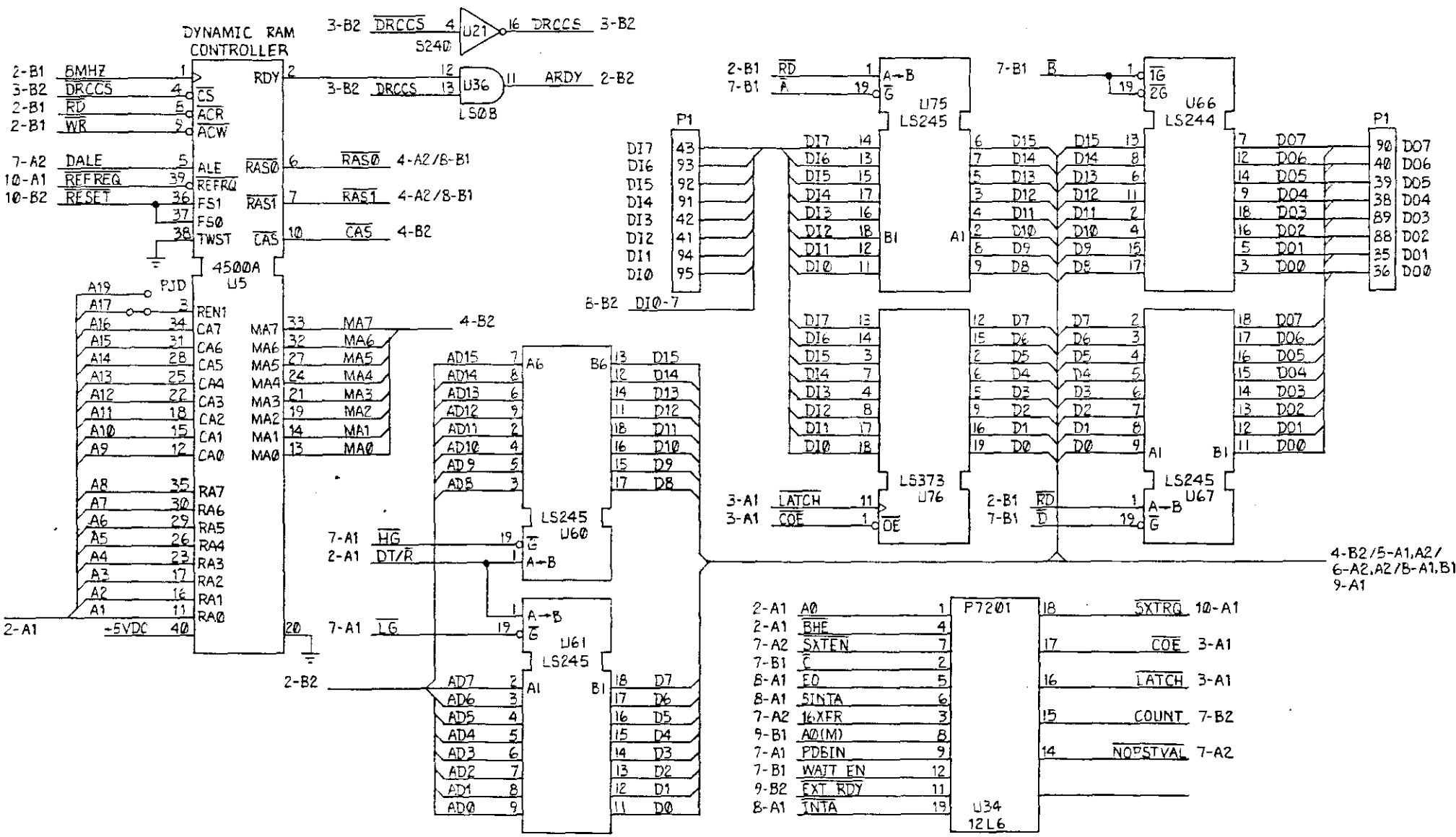
uA78H05	+5V Regulator		1
3.3K ohm SIP	Resistor 10-pin SIP	RN2,4	2
4.7K ohm SIP	Resistor 6-pin SIP	RN1,3	2
10 ohm	Resistor 5 watt	R12	1
33 ohm	Resistor 1/4 watt	R5,6,8	3
330 ohm	Resistor 1/4 watt	R3,4	2
1.2K ohm	Resistor 1/4 watt	R2	1
3.3K ohm	Resistor 1/4 watt	R1,7	2
4.7K ohm	Resistor 1/4 watt	R11	1
10K ohm	Resistor 1/4 watt	R9	1
20K ohm	Resistor 1/4 watt	R10	1
1.8432 MHz	Crystal	Y1	1
16 MHz	Crystal, Parallel Resonant	Y2	1
20 pico-farad	Capacitor, Cer	C7,8	2
10 micro-farad	Capacitor, Tant	C27,30	2
22 micro-farad	Capacitor, Tant	C29	1
0.01 micro-farad	Capacitor, Ceramic	C1,28	2
0.1 micro-farad	Capacitor, Tant	C2-6,9-26,31-50	43
8X2 jumper array		IO PORT SEL	1
5X2 jumper array		EXT MEM ADDR	1
#6 Nut			2
#6 Washer			4
6/32x1/2 Screw			2
BLANK CPS-186			1
ICC-50J68-2-G	68-pin Leadless Carrier	U26	1
2-640463-3 8PNSCKT	8-pin socket	U41	1
2-640357-3 14PNSCKT	14-pin socket	U1,15,21,22, 31-33,42,54,62,69	11
2-640358-3 16PNSCKT	16-pin socket	U11-14,17-20,23, 27-30,37-40,46-49,50-53, 58-61,65-68	33
2-640464-3 20PNSCKT	20-pin socket	U8-10,16,24, 25,34-36,43-45,55-57, 63,64,71-74	21
2-640361-3 24PNSCKT	24-pin socket	U2	1
2-641932 24PNSCKT	24-pin socket	NAR .3 SCKT U70	1
2-640362-3 28PNSCKT	28-pin socket	U7	1
2-640379-3 40PNSCKT	40-pin socket	U3-6	4
Heatsink 6104B	Base w/Hat		1
IDH-16LP-SR3-TG	16-pin male rt. angle cnctr	J1-4	4
IDH-26LP-SR3-TG	26-pin male rt. angle cnctr	J6	1
CNCTR RT ANGLE 1X2	1X2 RIGHT ANGLE	J5	1
Card Ejector	w/ pins		2

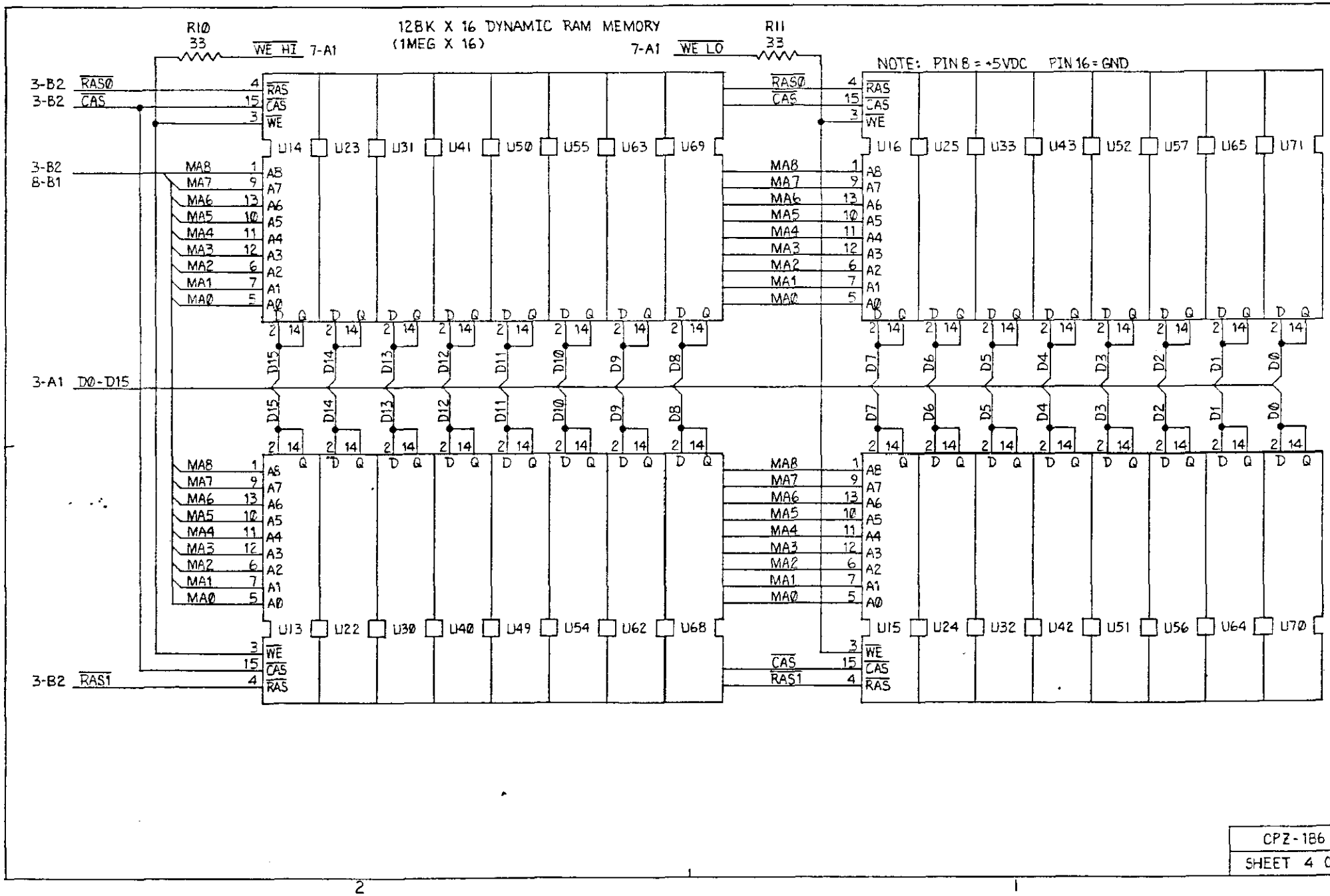
80186	8 MHz 16-bit Microprocessor	U26	1
Z8531	Serial Communications Controller	U3,4	2
Z8536	Counter/Timer & Parallel Interface	U6	1
8259A	Interrupt Controller	U7	1
8253	Timer/Counter	U2	1
TMS4500A-15	DRAM Controller	U5	1
M5K4164AP-15	64K DRAM's	U11-14,17-20,27-30,37-40, 46-49,50-53,58-61,65-68	32
PAL12L6	PAL	U16	1
PAL16L8	PAL	U9,34	2
AM27S291ADC	2K x 8 PROM	U70	1
AM25LS2521	8-BIT COMPARATOR	U63,71	2
74LS00	NAND GATE, QUAD	U21	1
74LS02	NOR GATE, QUAD	U22	1
74LS04	INVERTER, HEX	U1,15	2
74LS10	NAND GATE, TRI	U62	1
74S32	OR GATE, QUAD	U31	1
74LS74	FLIP-FLOP, DUAL	U32,33,42,54	4
74LS175	REGISTER, QUAD	U23	1
74LS240	INVERTER, OCTAL	U43	1
74S240	INVERTER, OCTAL	U8	1
74LS244	BUFFER, OCTAL	U24,44,55,56,64,72,74	7
74LS245	TRANSCEIVER, OCTAL	U35,45,57,73	4
74LS373	REGISTER, OCTAL	U10,25,36	3
7438	NAND GATE, QUAD OC	U69	1
555	ONE SHOT	U41	1



DESIGNED BY: R. TOZAKI 1-85	INTERCONTINENTAL MICRO SYSTEMS	
	SCHEMATIC/LOGIC DIAGRAM	
	16-BIT SINGLE BOARD MASTER PROCESSOR	
REV: B	CPZ-186	SHEET 1 OF 10

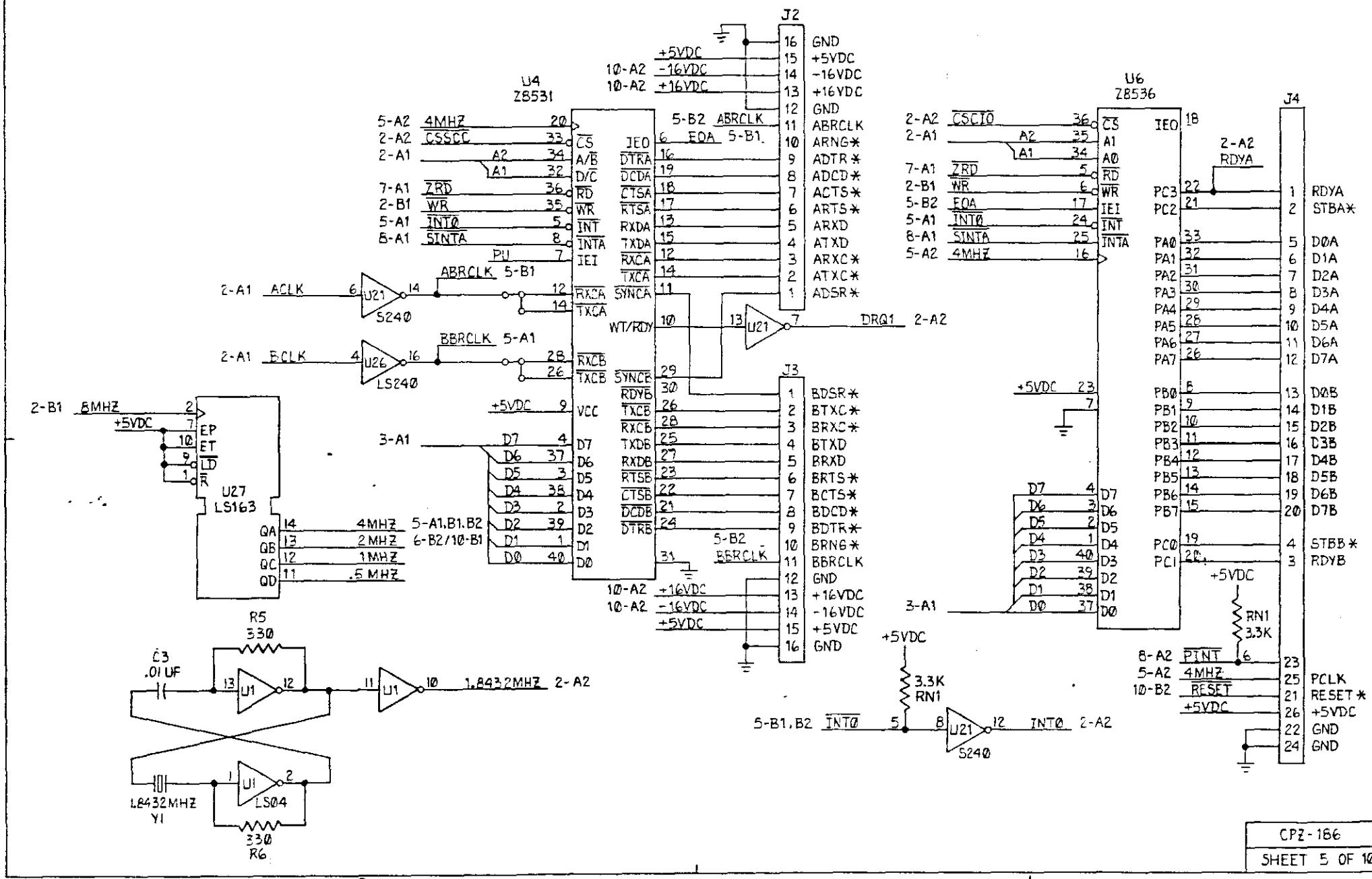

C16
20PF
Y2
16 MHZ
C15
20PF
X1
X2
U39
80186
10-B2 RESET
3-B2 ARDY
8-B1 SRDY
9-B2 HOLD
5-A1 INT0
8-A1 INT1
8-A1/7-A2 INTA0
8-A1,A2 INTA1
5-A2 1.8432 MHZ
6-B2 DRQ0
5-B1 DRQ1
5-B1 RDYA
PJE
+5VDC
8-A2 INMI
NMI
TEST
5-B2/7-A2
2-B1/3-B2 8MHZ
2-B1,B1/7-A2
3-B2/7-A2,B2,B2/2-B1 ALE
3-B2/6-B2/7-A2/8-A2,B2/9-B2/3-A1,B1 RD
3-B2/5-B1,B2/6-B2/7-A2/8-A2/9-B2 WR
2-A1/3-A2 XA19
XA18
XA17
XA16
AD15
AD14
AD13
AD12
AD11
AD10
AD9
AD8
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
7-A2,B2/3-A1 BHE
7-A2 DEN
3-A2 DT/R
7-A1 UCS
LCS
5-B1,B2/6-B2
7-A2,B1/8-A2 PCS6
CSINT
CSCIO
CSSCC
CSFDC
PCS5
PCS0
5-B2 ACLK
5-B2 BCLK
2-B1/9-A2 HLDA
RESET
LOCK
2-B1 8MHZ
S240 U21
7-A2,A2,A2,B1,B2/10-B1 8MHZ
RN1
3.3K
+5VDC
2-B1 ALE
2-A1 HLDA
OE
LS373
U38
U47
U48
9-B2
3-A2/5-B1,B2
6-B2/7-A2,B2
8-A2,B2,B1
9-A1,A1,A2
3-A1
CPZ-186
SHEET 2 OF 10

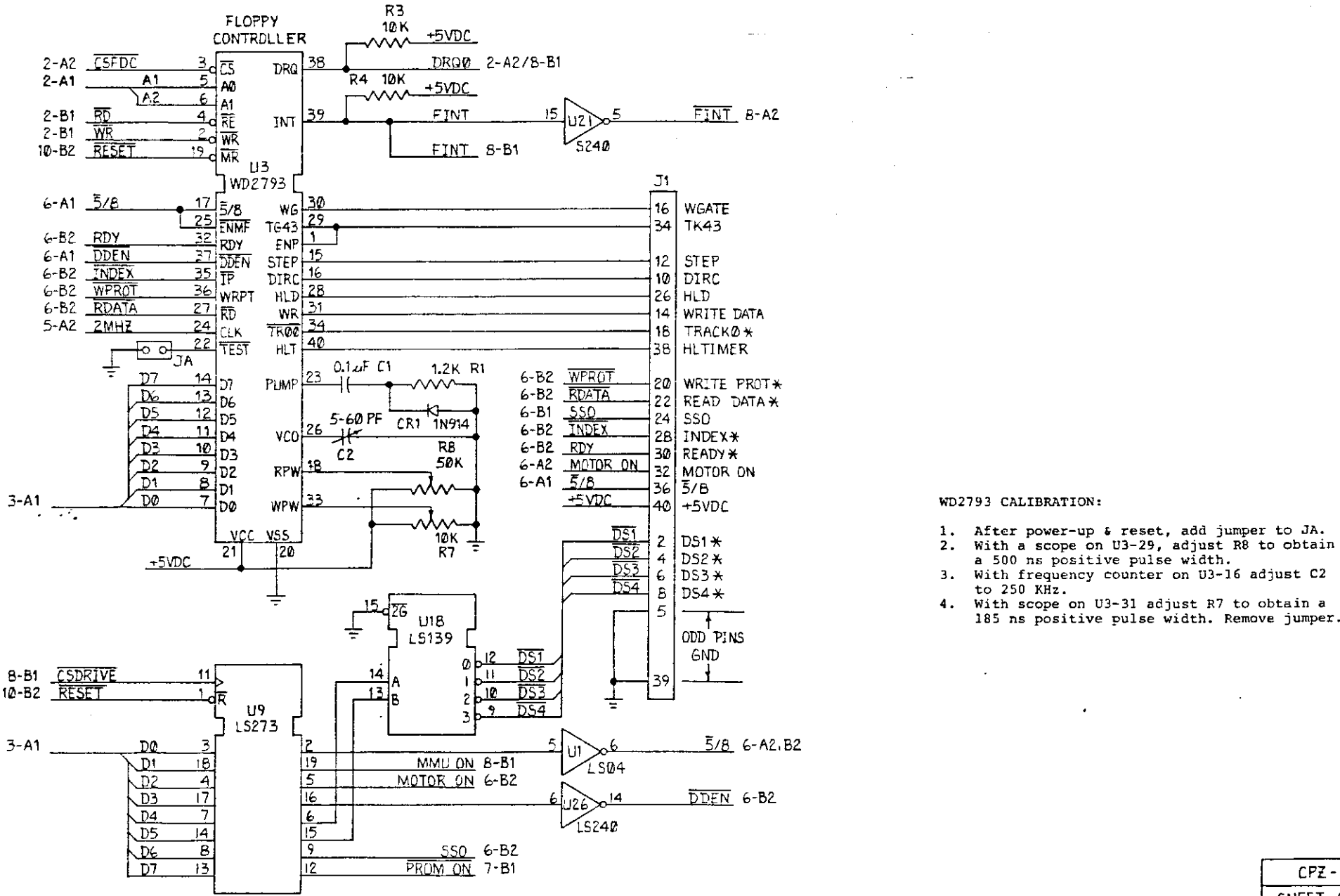

DYNAMIC RAM CONTROLLER
4500A
U5
LS240
U21
LS08
U36
LS245
U75
LS244
U66
LS373
U76
LS245
U67
LS245
U60
LS245
U61
P7201
U34
12L6
P1
P1
CPZ-186
SHEET 3 OF 10



CPZ-186

SHEET 4 OF 1


J2
U4
Z8531
U6
Z8536
J4
J3
U27
LS163
U21
S240
U26
LS240
U1
LS04
R5
330
R6
330
C3
.01 UF
Y1
1.8432MHZ
RN1
3.3K
+5VDC
GND
4MHZ
2MHZ
1MHZ
.5 MHZ
1.8432MHZ
ABRCLK
BBRCLK
ACLK
BCLK
RDYA
STBA*
D0A
D1A
D2A
D3A
D4A
D5A
D6A
D7A
D0B
D1B
D2B
D3B
D4B
D5B
D6B
D7B
STBB*
RDYB
PCLK
RESET*
INT0
DRQ1
CPZ-186
SHEET 5 OF 10



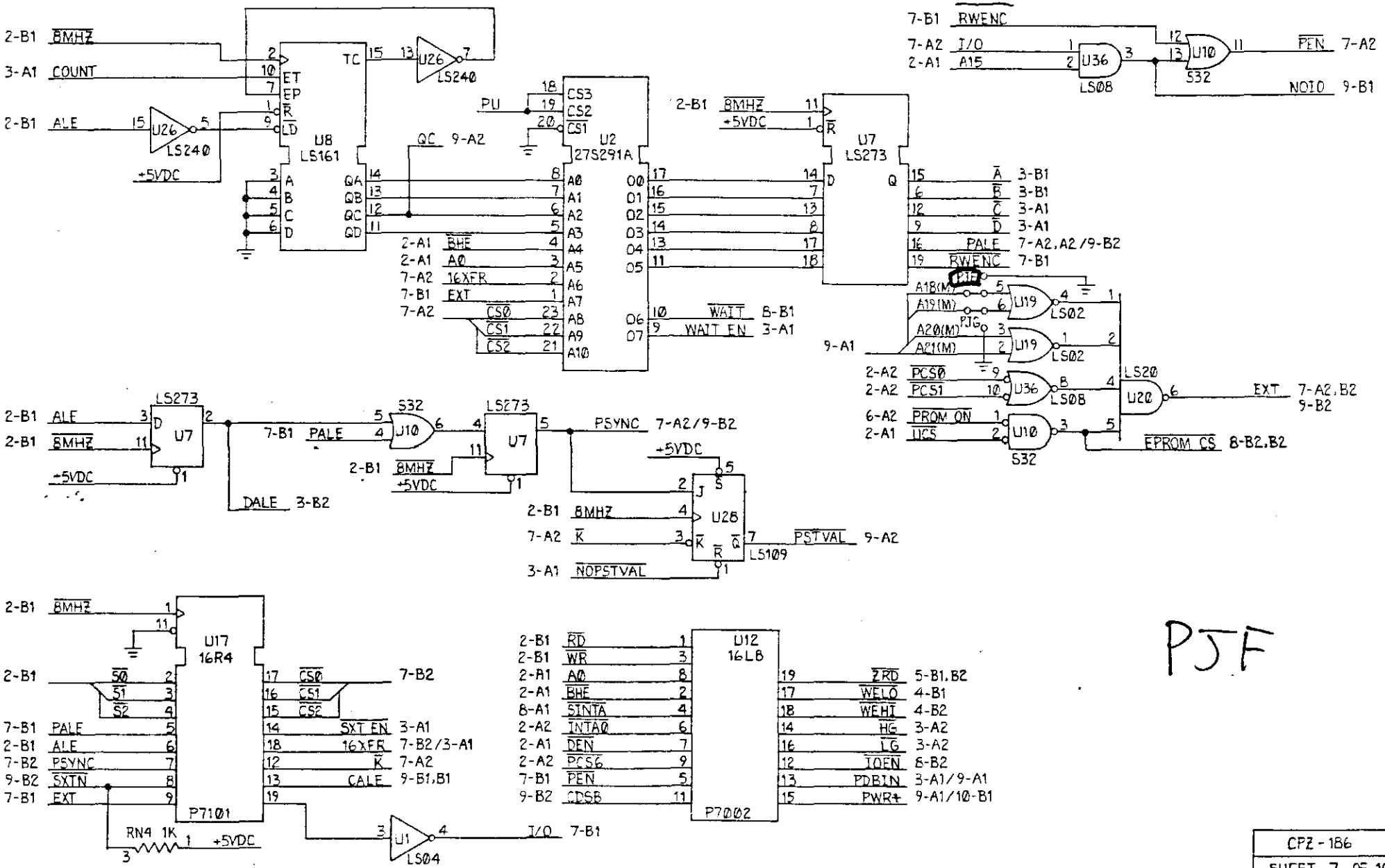
WD2793 CALIBRATION:

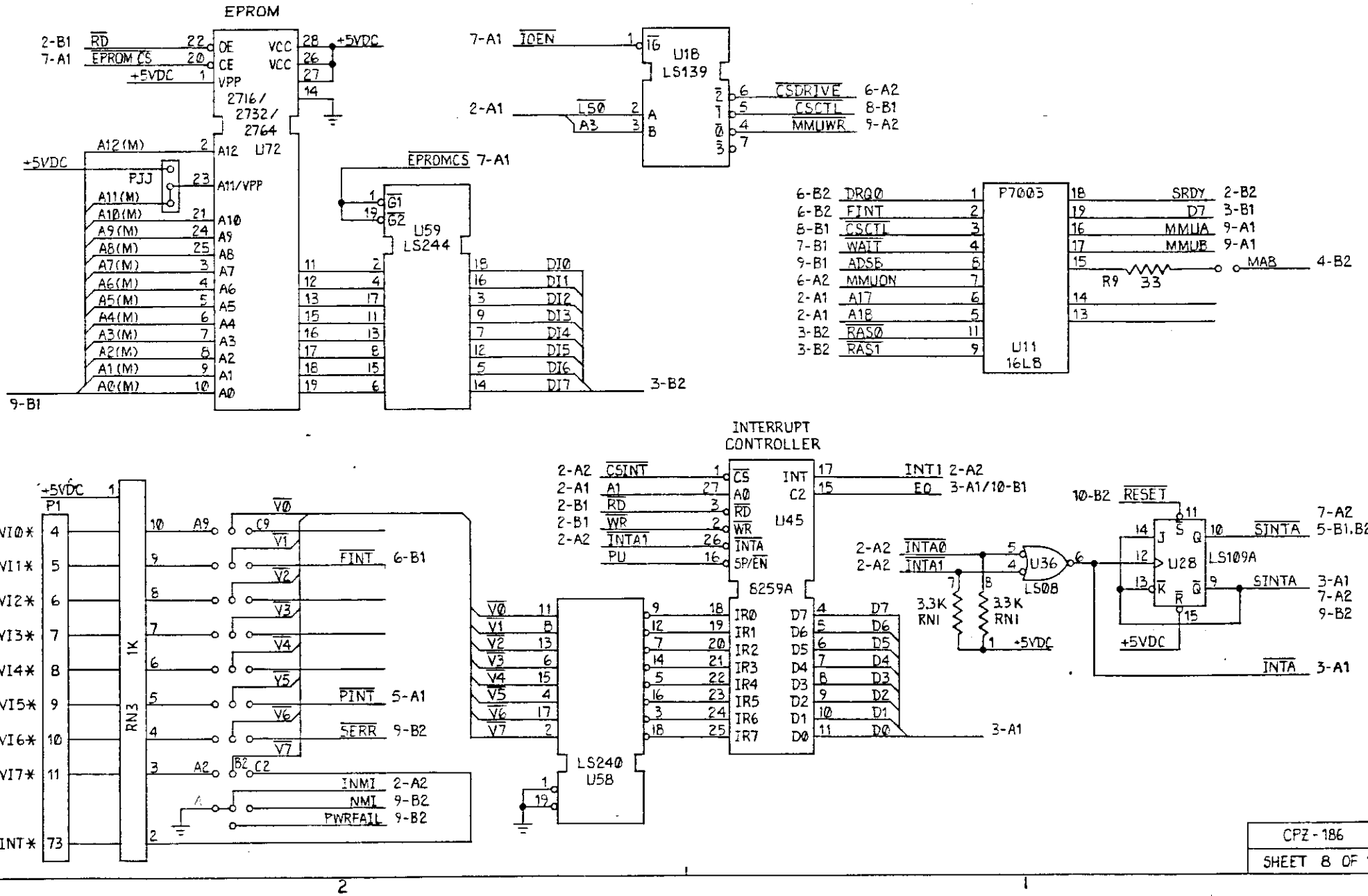
1. After power-up & reset, add jumper to JA.
2. With a scope on U3-29, adjust R8 to obtain a 500 ns positive pulse width.
3. With frequency counter on U3-16 adjust C2 to 250 KHz.
4. With scope on U3-31 adjust R7 to obtain a 185 ns positive pulse width. Remove jumper.

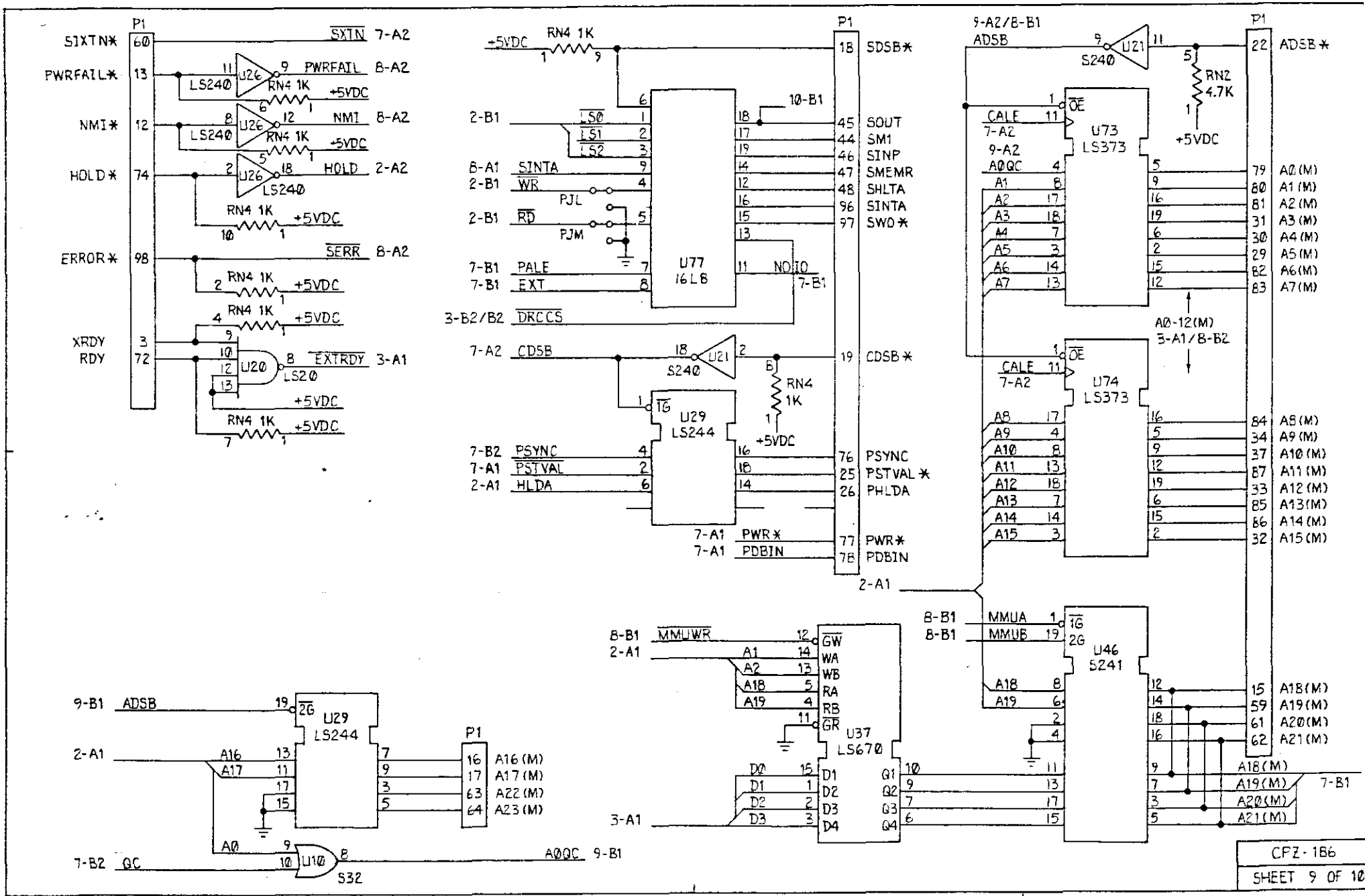
CPZ-186

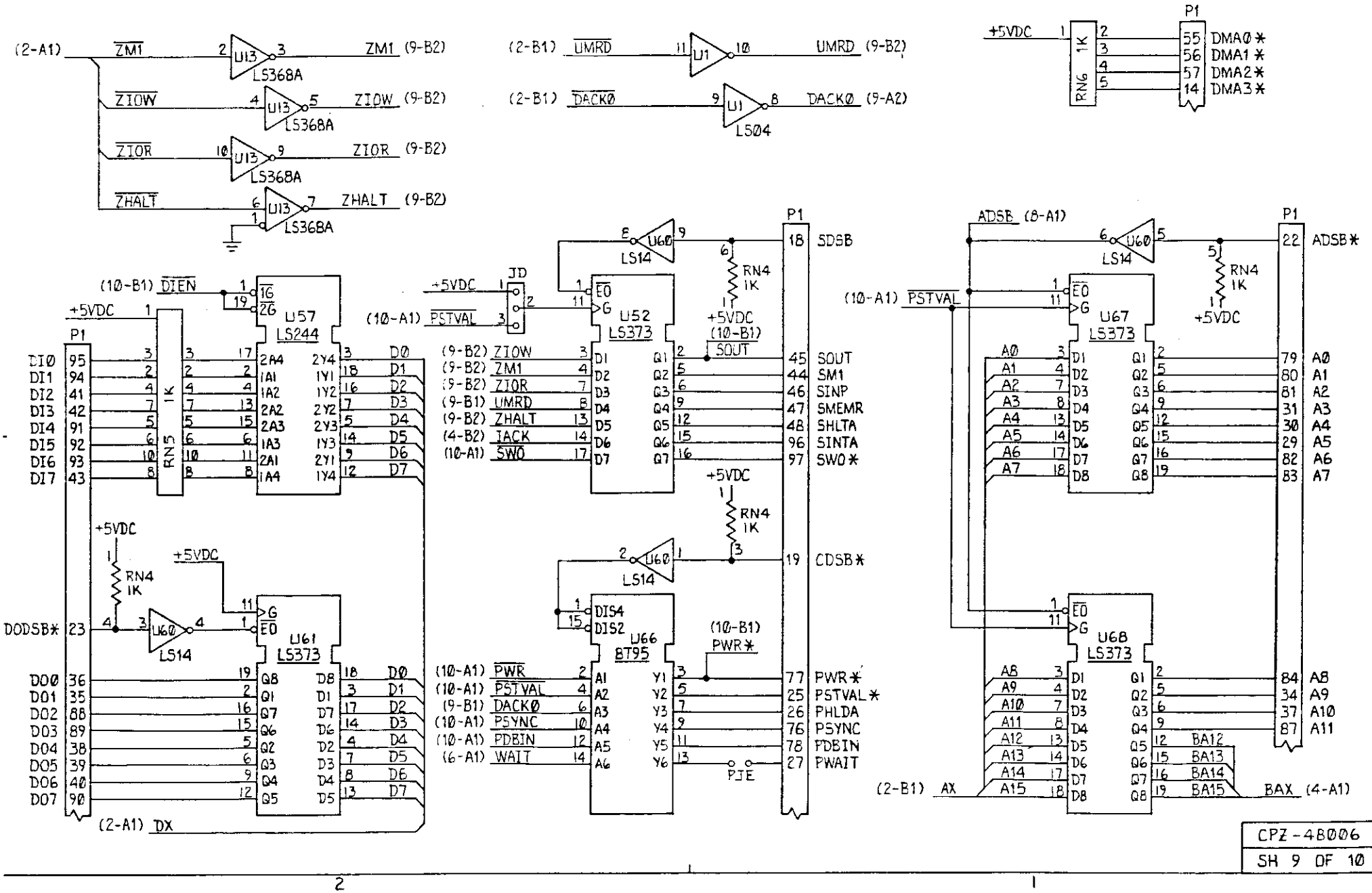
SHEET 6 OF 10

2 1

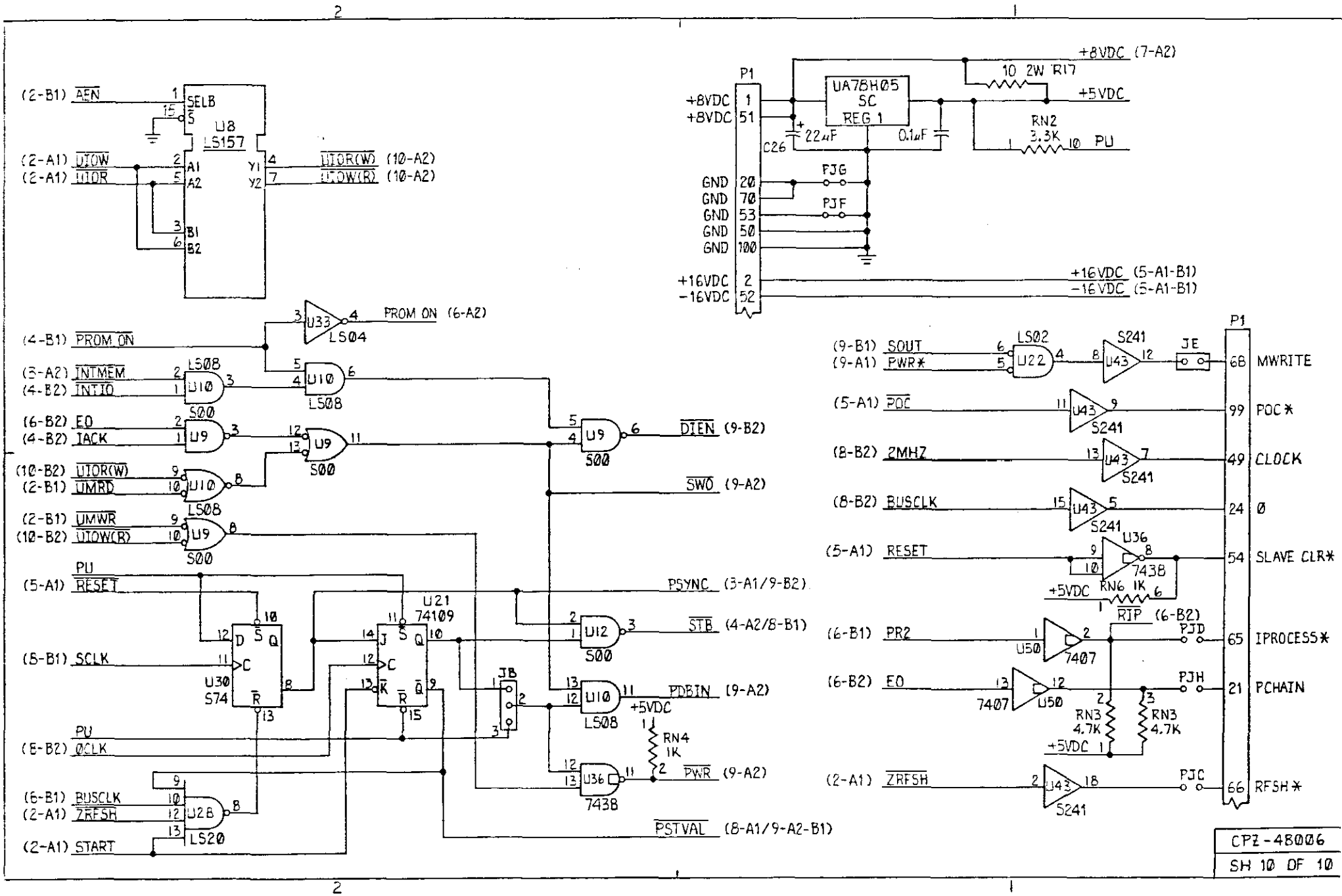

2-B1 8MHZ
3-A1 COUNT
2-B1 ALE
+5VDC
U8 LS161
TC
U26 LS240
ET
EP
R
LD
A
B
C
D
QA
QB
QC
QD
QC 9-A2
PU
U2 27S291A
CS3
CS2
CS1
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
O0
O1
O2
O3
O4
O5
O6
O7
2-A1 BHE
2-A1 A0
7-A2 16XFR
7-B1 EXT
7-A2 CS0
CS1
CS2
10 WAIT B-B1
9 WAIT EN 3-A1
2-B1 8MHZ
+5VDC
U7 LS273
D
Q
15 Ā 3-B1
6 B̄ 3-B1
12 C̄ 3-A1
9 D̄ 3-A1
16 PALE 7-A2,A2/9-B2
19 RWENC 7-B1
7-B1 RWENC
7-A2 I/O
2-A1 A15
U36 LS08
U10 S32
PEN 7-A2
NOIO 9-B1
A18(M)
A19(M)
A20(M)
A21(M)
PJG
U19 LS02
9-A1
2-A2 PCS0
2-A2 PCS1
6-A2 PROM ON
2-A1 UCS
LS20
EXT 7-A2,B2 9-B2
EPROM CS B-B2,B2
2-B1 ALE
2-B1 8MHZ
+5VDC
DALE 3-B2
7-B1 PALE
PSYNC 7-A2/9-B2
U28
J
K
S
R
Q
LS109
2-B1 8MHZ
7-A2 K
3-A1 NOPSTVAL
PSTVAL 9-A2
U17 16R4
P7101
2-B1 S0
S1
S2
7-B1 PALE
2-B1 ALE
7-B2 PSYNC
9-B2 SXTN
7-B1 EXT
CS0 7-B2
CS1
CS2
SXT EN 3-A1
16XFR 7-B2/3-A1
K 7-A2
CALE 9-B1,B1
RN4 1K
+5VDC
U1 LS04
I/O 7-B1
U12 16L8
P7002
2-B1 RD
2-B1 WR
2-A1 A0
2-A1 BHE
8-A1 SINTA
2-A2 INTA0
2-A1 DEN
2-A2 PCS6
7-B1 PEN
9-B2 CDSB
ZRD 5-B1,B2
WELO 4-B1
WEHI 4-B2
HG 3-A2
LG 3-A2
IOEN 8-B2
PDBIN 3-A1/9-A1
PWR+ 9-A1/10-B1
PJF
CPZ-186
SHEET 7 OF 10
2
1


EPROM
2-B1 RD 22 OE
7-A1 EPROM CS 20 CE
+5VDC 1 VPP
2716/ 2732/ 2764
VCC 28 +5VDC
VCC 26
27
14
U72
A12(M) 2 A12
+5VDC PJJ 23 A11/VPP
A11(M)
A10(M) 21 A10
A9(M) 24 A9
A8(M) 25 A8
A7(M) 3 A7
A6(M) 4 A6
A5(M) 5 A5
A4(M) 6 A4
A3(M) 7 A3
A2(M) 8 A2
A1(M) 9 A1
A0(M) 10 A0
9-B1
EPROMCS 7-A1
1 G1
19 G2
U59 LS244
11 2
12 4
13 17
15 11
16 13
17 8
18 15
19 6
18 DI0
16 DI1
3 DI2
9 DI3
7 DI4
12 DI5
5 DI6
14 DI7
3-B2
7-A1 IOEN 1 1G
2-A1 LS0 2 A
A3 3 B
U1B LS139
2 6 CSDRIVE 6-A2
1 5 CSCTL 8-B1
0 4 MMUWR 9-A2
3 7
6-B2 DRQ0 1
6-B2 FINT 2
8-B1 CSCTL 3
7-B1 WAIT 4
9-B1 ADS6 5
6-A2 MMUON 7
2-A1 A17 6
2-A1 A18 5
3-B2 RAS0 11
3-B2 RAS1 9
P7003
U11 16L8
18 SRDY 2-B2
19 D7 3-B1
16 MMUA 9-A1
17 MMUB 9-A1
15 MAB 4-B2
R9 33
14
13
INTERRUPT CONTROLLER
2-A2 CSINT 1 CS
2-A1 A1 27 A0
2-B1 RD 3 RD
2-B1 WR 2 WR
2-A2 INTA1 26 INTA
PU 16 SP/EN
U45
8259A
17 INT 2-A2
15 EQ 3-A1/10-B1
INTA0 5
INTA1 4
U36 LS08
3.3K RNI
3.3K RNI
+5VDC
10-B2 RESET
U28 LS109A
14 J
13 K
11 S
10 Q
12
9 Q
15
SINTA 7-A2 5-B1,B2
SINTA 3-A1 7-A2 9-B2
INTA 3-A1
+5VDC
P1
+5VDC 1
VI0* 4
VI1* 5
VI2* 6
VI3* 7
VI4* 8
VI5* 9
VI6* 10
VI7* 11
INT* 73
RN3 1K
10 A9
9
8
7
6
5
4
3 A2
2
C9
V0
V1
V2
V3
V4
V5
V6
V7
FINT 6-B1
PINT 5-A1
SERR 9-B2
B2 C2
INMI 2-A2
NMI 9-B2
PWRFAIL 9-B2
V0 11
V1 8
V2 13
V3 6
V4 15
V5 4
V6 17
V7 2
LS240 U58
1
19
9 18 IR0 D7 4 D7
12 19 IR1 D6 5 D6
7 20 IR2 D5 6 D5
14 21 IR3 D4 7 D4
5 22 IR4 D3 8 D3
16 23 IR5 D2 9 D2
3 24 IR6 D1 10 D1
18 25 IR7 D0 11 D0
3-A1
CPZ - 186
SHEET 8 OF 10


P1
SIXTN* 60 SXTN 7-A2
PWRFAIL* 13 U26 LS240 PWRFAIL 8-A2
NMI* 12 NMI 8-A2
HOLD* 74 HOLD 2-A2
ERROR* 98 SERR 8-A2
XRDY 3
RDY 72 U20 LS20 EXTRDY 3-A1
RN4 1K +5VDC
+5VDC
RN4 1K
U77 16L8
2-B1 LS0
LS1
LS2
8-A1 SINTA
2-B1 WR
PJL
2-B1 RD
PJM
7-B1 PALE
7-B1 EXT
3-B2/B2 DRCCS
10-B1
NOIO 7-B1
7-A2 CDSB
U21 S240
U29 LS244
7-B2 PSYNC
7-A1 PSTVAL
2-A1 HLDA
7-A1 PWR*
7-A1 PDBIN
SDSB*
SOUT
SM1
SINP
SMEMR
SHLTA
SINTA
SWO*
CDSB*
PSYNC
PSTVAL*
PHLDA
PWR*
PDBIN
2-A1
9-A2/B-B1 ADSB
U21 S240
RN2 4.7K
U73 LS373
CALE 7-A2
9-A2
A0QC
A1
A2
A3
A4
A5
A6
A7
A0-12(M) 3-A1/B-B2
U74 LS373
A8
A9
A10
A11
A12
A13
A14
A15
ADSB*
A0(M)
A1(M)
A2(M)
A3(M)
A4(M)
A5(M)
A6(M)
A7(M)
A8(M)
A9(M)
A10(M)
A11(M)
A12(M)
A13(M)
A14(M)
A15(M)
8-B1 MMUWR
2-A1 A1
A2
A18
A19
U37 LS670
GW
WA
WB
RA
RB
GR
D0
D1
D2
D3
3-A1
Q1
Q2
Q3
Q4
8-B1 MMUA
8-B1 MMUB
U46 5241
A18(M)
A19(M)
A20(M)
A21(M)
7-B1
9-B1 ADSB
2-A1 A16
A17
U29 LS244
A16(M)
A17(M)
A22(M)
A23(M)
7-B2 QC
A0
U10 S32
A0QC 9-B1
CPZ-186
SHEET 9 OF 10



CPZ-48006
SH 9 OF 10


(2-B1) AEN
U8 LS157
(2-A1) UIOW
(2-A1) UIOR
UIOR(W) (10-A2)
UIOW(R) (10-A2)
P1
+8VDC (7-A2)
10 2W R17
UA78H05 SC REG 1
+5VDC
+8VDC
C26 22uF
0.1uF
RN2 3.3K
PU
PJG
PJF
GND
+16VDC (5-A1-B1)
-16VDC (5-A1-B1)
PROM ON (6-A2)
LS04
(4-B1) PROM ON
(3-A2) INTMEM
(4-B2) INTIO
LS08
(6-B2) ED
(4-B2) IACK
S00
(10-B2) UIOR(W)
(2-B1) UMRD
(2-B1) UMWR
(10-B2) UIOW(R)
DIEN (9-B2)
SWO (9-A2)
PU
(5-A1) RESET
PSYNC (3-A1/9-B2)
U21 74109
U30 S74
(5-B1) SCLK
STB (4-A2/8-B1)
JB
PDBIN (9-A2)
+5VDC
RN4 1K
(5-B2) 0CLK
PWR (9-A2)
7438
(6-B1) BUSCLK
(2-A1) ZRFSH
U28 LS20
(2-A1) START
PSTVAL (8-A1/9-A2-B1)
(9-B1) SOUT
(9-A1) PWR*
LS02
S241
JE
MWRITE
(5-A1) POC
POC*
(8-B2) 2MHZ
CLOCK
(8-B2) BUSCLK
Ø
(5-A1) RESET
SLAVE CLR*
RN6 1K
RIP (6-B2)
(6-B1) PR2
U50 7407
PJD
IPROCESS*
(6-B2) ED
PJH
PCHAIN
RN3 4.7K
(2-A1) ZRFSH
PJC
RFSH*
CPZ-48006
SH 10 OF 10